

CLAIMS

We claim:

5 1. A tool system adapted to operate on a work piece, said tool system comprising:

 a first guide system providing a first guide; and

 a tool including:

 an action component adapted to operate on said work piece,

10 a guide detector adapted to detect a position of said first guide and provide first guide position data corresponding to said position of said first guide, and

15 a location detector in communication with said guide detector to receive said first guide position data, wherein said location detector is adapted to determine an orientation of said action component, based at least in part on said first guide position data.

20 2. The tool system of claim 1, wherein said location detector is adapted to provide orientation information corresponding to said orientation of said action component.

25 3. The tool system of claim 2, wherein said tool further includes:

 a set of indicators in communication with said location detector to receive said orientation information, wherein a state of each indicator in said set is set in response to said orientation information.

30 4. The tool system of claim 3, wherein said first guide extends across a portion of said work piece and said orientation information received from said location controller indicates whether said action component is oriented to be one of the following: in line with said first guide, offset to a first side of said first guide, or offset to a second side of said first guide.

5. The tool system of claim 4, wherein said set of indicators includes:

a first indicator adapted to be asserted when said orientation information indicates said action component is oriented to be in line with said first guide,

5 a second indicator adapted to be asserted when said orientation information indicates said component is oriented to be offset to a first side of said first guide, and

10 a third indicator adapted to be asserted when said orientation information indicates said component is oriented to be offset to a second side of said first guide.

6. The tool system of claim 5, wherein said first guide system is a laser system and said first guide is a laser beam.

15 7. The tool system of claim 1, wherein said orientation information indicates whether a tool adjustment is needed.

8. The tool system of claim 7, further including:

20 a component controller in communication with said location detector to receive said orientation information and in communication with said action component to adjust said action component in response to said orientation information.

25 9. The tool system of claim 8, wherein said first guide extends across a portion of said work piece and said orientation information received from said location detector indicates whether said action component is oriented to be one of the following: in line with said first guide, offset to a first side of said first guide, or offset to a second side of said first guide.

10. The tool system of claim 9, wherein said component controller is adapted to orient said action component to be in line with said first guide in response to said orientation information.

5 11. The tool system of claim 10, wherein said component controller is adapted to orient said action component as follows:

if said orientation information indicates said action component is oriented to be in line with said first guide, said component controller maintains said orientation of said action component,

10 if said orientation information indicates said action component is oriented to be offset to said first side of said first guide, said component controller modifies said orientation of said action component to be in line with said first guide, and

15 if said orientation information indicates said action component is oriented to be offset to said second side of said first guide, said component controller modifies said orientation of said action component to be in line with said first guide.

20 12. The tool system of claim 11, wherein said tool is a jigsaw, said action component is a blade, and said component controller drives a motor coupled to said blade to orient said blade in response to said orientation information.

25 13. The tool system of claim 11, wherein said tool is a circular saw, said action component is a blade, and said component controller is in communication with a set of pistons to orient said blade in response to said orientation information.

30 14. The tool system of claim 11, wherein said first guide system is a laser system and said first guide is a laser beam.

15. The tool system of claim 7, further including:

a component controller in communication with said location detector to receive said orientation information and in communication with said action component to set a state of said action component in response to said orientation information.

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16. The tool system of claim 15, wherein said first guide extends across said work piece and said orientation information received from said location detector indicates whether said action component is oriented to be one of the following: in line with said first guide, offset to a first side of said first guide, or offset to a second side of said first guide.

17. The tool system of claim 16, wherein said tool is a nail gun, said action component is a nail firing mechanism, and said component controller is adapted to set said state of said action component as follows:

15 if said orientation information indicates said action component is oriented to be in line with said first guide, said component controller disables said nail firing mechanism,

20 if said orientation information indicates said action component is oriented to be offset to said first side of said first guide, said component controller enables said nail firing mechanism, and

if said orientation information indicates said action component is oriented to be offset to said second side of said first guide, said component controller enables said nail firing mechanism.

25 18. The tool system of claim 17, wherein said first guide system is a laser system and said first guide is a laser beam.

19. The tool system of claim 1, further including:
a second guide system providing a second guide, wherein:
30 said guide detector is adapted to detect a position of said second guide and provide second guide position data corresponding to said position of said second guide, and

5 said location detector is in communication with said guide detector to receive said second guide position data, wherein said location detector is adapted to determine an orientation of said action component, based at least in part on said first guide position data and said second guide position data.

10 21. The tool system of claim 19 wherein said location detector is adapted to provide orientation information corresponding to said orientation of said action component.

15 22. The tool system of claim 21, further including:
a component controller in communication with said location detector to receive said orientation information and in communication with said action component to adjust said action component in response to said orientation information.

20 23. The tool system of claim 22, wherein said tool is a router, said action component is a cutting head, and said component controller is adapted to adjust a vertical displacement of said cutting head in response to said orientation information.

25 24. The tool system of claim 22, wherein said tool is a nail gun, said action component is a nail firing mechanism, and said component controller is adapted to adjust a state of said action component as follows:

if said orientation information indicates said action component is oriented in line with a location on said work piece where a nail is to be fired, said component controller enables said nail firing mechanism, and

30 if said orientation information indicates said action component is not oriented in line with a location on said work piece where a nail is to be fired, said component controller disables said nail firing mechanism.

25. The tool system of claim 20, wherein said first guide system is a first laser system, said first guide is a first laser beam, said second guide system is a second laser system, and said second guide is a second laser
5 beam.

26. A tool adapted to operate on a work piece, said tool comprising:
an action component adapted to operate on said work piece,
a guide detector adapted to detect a position of a first guide and
10 provide first guide position data corresponding to said position of said first
guide; and
a location detector in communication with said guide detector to
receive said first guide position data, wherein said location detector is adapted
to determine an orientation of said action component, based at least in part on
15 said first guide position data.

27. The tool of claim 26, wherein said location detector is adapted to
provide orientation information corresponding to said orientation of said action
component.

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28. The tool system of claim 27, wherein said tool further includes:
a set of indicators in communication with said location detector to
receive said orientation information, wherein a state of each indicator in said
set is set in response to said orientation information.

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29. The tool of claim 28, wherein said first guide extends across a
portion of said work piece and said orientation information received from said
location controller indicates whether said action component is oriented to be
one of the following: in line with said first guide, offset to a first side of said
30 first guide, or offset to a second side of said first guide.

30. The tool of claim 29, wherein said set of indicators includes:

a first indicator adapted to be asserted when said orientation information indicates said action component is oriented to be in line with said first guide,

5 a second indicator adapted to be asserted when said orientation information indicates said component is oriented to be offset to a first side of said first guide, and

a third indicator adapted to be asserted when said orientation information indicates said component is oriented to be offset to a second side of said first guide.

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31. The tool of claim 26, wherein said first guide is a laser beam and said guide detector is a photo diode detector array.

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32. The tool of claim 26, wherein said orientation information indicates whether a tool adjustment is needed.

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33. The tool of claim 32, further including:

a component controller in communication with said location detector to receive said orientation information and in communication with said action component to adjust said action component in response to said orientation information.

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34. The tool of claim 33, wherein said first guide extends across a portion of said work piece and said orientation information received from said location detector indicates whether said action component is oriented to be one of the following: in line with said first guide, offset to a first side of said first guide, or offset to a second side of said first guide.

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35. The tool of claim 34, wherein said component controller is adapted to orient said action component to be in line with said portion of said first guide in response to said orientation information.

36. The tool of claim 35, wherein said component controller is adapted to orient said action component as follows:

if said orientation information indicates said action component is oriented to be in line with said first guide, said component controller maintains

5 said orientation of said action component,

if said orientation information indicates said action component is oriented to be offset to said first side of said first guide, said component controller modifies said orientation of said action component to be in line with said first guide, and

10 if said orientation information indicates said action component is oriented to be offset to said second side of said first guide, said component controller modifies said orientation of said action component to be in line with said first guide.

15 37. The tool of claim 36, wherein said tool is a jigsaw, said action component is a blade, and said component controller drives a motor coupled to said blade to orient said blade in response to said orientation information.

20 38. The tool of claim 36, wherein said tool is a circular saw, said action component is a blade, and said component controller is in communication with a set of pistons to orient said blade in response to said orientation information.

25 39. The tool of claim 32, further including:

a component controller in communication with said location detector to receive said orientation information and in communication with said action component to adjust said action component in response to said orientation information.

30 40. The tool of claim 39, wherein said first guide extends across a portion of said work piece and said orientation information received from said location detector indicates whether said action component is oriented to be

one of the following: in line with said first guide, offset to a first side of said first guide, or offset to a second side of said first guide.

41. The tool of claim 40, wherein said tool is a nail gun, said action component is a nail firing mechanism, and said component controller is adapted to adjust said action component as follows:

5 if said orientation information indicates said action component is oriented to be in line with said first guide, said component controller disables said nail firing mechanism,

10 if said orientation information indicates said action component is oriented to be offset to said first side of said first guide, said component controller enables said nail firing mechanism, and

15 if said orientation information indicates said action component is oriented to be offset to said second side of said first guide, said component controller enables said nail firing mechanism.

42. The tool of claim 26, wherein said guide detector is further adapted to detect a position of a second guide and provide second guide position data corresponding to said position of said second guide,

20 wherein said location detector is in communication with said guide detector to receive said second guide position data, wherein said location detector is adapted to determine an orientation of said action component, based at least in part on said first guide position data and said second guide position data.

25 43. The tool of claim 42 wherein said location detector is adapted to provide orientation information corresponding to said orientation of said action component.

30 44. The tool of claim 43, wherein said orientation information indicates whether an adjustment to said action component is needed.

45. The tool of claim 44, further including:

a component controller in communication with said location detector to receive said orientation information and in communication with said action component to adjust said action component in response to said orientation information.

46. The tool of claim 45, wherein said tool is a router, said action component is a cutting head, and said component controller is adapted to adjust a vertical displacement of said cutting head in response to said orientation information.

47. The tool of claim 45, wherein said tool is a nail gun, said action component is a nail firing mechanism, and said component controller is adapted to adjust said action component as follows:

if said orientation information indicates said action component is oriented in line with a location on said work piece where a nail is to be fired, said component controller enables said nail firing mechanism, and

if said orientation information indicates said action component is not oriented in line with a location on said work piece where a nail is to be fired, said component controller disables said nail firing mechanism.

48. The tool of claim 42, wherein said first guide is a first laser beam and said second guide is a second laser beam.

49. The tool of claim 42, wherein said first guide is a first guide wire and said second guide is a second guide wire.

50. A tool adapted to operate on a work piece, said tool comprising:

an action component adapted to operate on said work piece,

a location detector adapted to determine an orientation of said component, based at least in part on a position of a set of one or more guides, and provide orientation information corresponding to said orientation; and

a component controller in communication with said location detector to receive said orientation information and in communication with said action component to adjust said action component in response to said orientation information.

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51. The tool of claim 50, wherein said tool further includes:

a set of indicators in communication with said location detector to receive said orientation information, wherein a state of each indicator in said set is set in response to said orientation information.

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52. The tool of claim 50, wherein said orientation information indicates whether an action component adjustment is needed.

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53. The tool of claim 52, wherein said component controller is in communication with said action component to orient said action component in response to said orientation information.

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54. The tool of claim 52, wherein said component controller is in communication with said action component to change a state of said action component in response to said orientation information.

55. The tool of claim 52, wherein said tool is a jigsaw, said action component is a blade, and said component controller drives a motor coupled to said blade to orient said blade in response to said orientation information.

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56. The tool of claim 52, wherein said tool is a circular saw, said action component is a blade, and said component controller orients said blade in response to said orientation information.

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57. The tool of claim 56, wherein said component controller is in communication with a set of pistons to orient said blade in response to said orientation information.

58. The tool of claim 52, wherein said tool is a router and said action component is a cutting head.

5 59. The tool of claim 58, wherein said component controller is adapted to adjust a vertical displacement of said cutting head in response to said orientation information.

10 60. The tool of claim 52, wherein said tool is a nail gun and said action component is a nail firing mechanism.

61. The tool of claim 60, wherein said component controller is adapted to set a state of said nail firing mechanism as follows:

15 if said orientation information indicates said nail firing mechanism is oriented in line with a location on said work piece where a nail is to be fired, said component controller enables said nail firing mechanism, and

if said orientation information indicates said nail firing mechanism is not oriented in line with a location on said work piece where a nail is to be fired, said component controller disables said nail firing mechanism.

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62. The tool of claim 50, wherein said set of one or more guides includes at least one laser beam.

25 63. The tool of claim 50, wherein said set of one or more guides includes at least one guide wire.

64. The tool of claim 50, wherein said set of one or more guides includes a track ball.

30 65. A method for identifying the orientation of a tool on a work piece, wherein said tool includes an action component for operating on said work piece, said method including the steps of:

(a) detecting position data for one or more guides;
(b) determining an orientation of said tool based at least in part on said position data detected in said step (a); and
(c) adjusting said tool in response to said orientation determined in
5 said step (b).

66. The method of claim 65, wherein said step (c) includes the step
of:

(1) asserting at least one indicator.

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67. The method of claim 66, wherein said at least one indicator
identifies a direction for steering said tool.

15 of:

(1) adjusting an orientation of said component.

68. The method of claim 65, wherein said step (c) includes the step
of:

20 (1) adjusting a state of said component.

70. The method of claim 65, wherein said one or more guides
includes at least one laser beam.

25 71. A tool adapted to operate on a work piece, said tool comprising:
an action component adapted to operate on said work piece;
one or more storage devices; and
one or more processors in communication with said one or more
storage devices and said action component, said one or more processors
30 perform a method comprising the steps of:

(a) determining an orientation of said tool based at least in part on a
position of a set of one or more guides; and

(b) adjusting said tool in response to said orientation determined in said step (c).

72. The tool of claim 71, wherein said step (b) includes the step of:
5 (1) asserting at least one indicator.

73. The tool of claim 71, wherein said step (b) includes the step of:
(1) adjusting an orientation of said component.

10 74. The tool of claim 71, wherein said step (b) includes the step of:
(1) adjusting a state of said component.

75. The tool of claim 71, wherein said tool is a jigsaw and said action component is a blade, wherein said step (b) includes the step of:

15 (1) adjusting an orientation of said blade.

76. The tool of claim 71, wherein said tool is a circular saw and said action component is a blade, wherein said step (b) includes the step of:

(1) adjusting an orientation of said blade.

20 77. The tool of claim 71, wherein said tool is a router and said action component is a cutting head, wherein said step (b) includes the step of:
(1) adjust a vertical displacement of said cutting head.

25 78. The tool of claim 71, wherein said tool is a nail gun and said action component is a nail firing mechanism, wherein said step (b) includes the steps of:

(1) enabling said nail firing mechanism if said orientation corresponds to said nail firing mechanism being in line with a location on said 30 work piece where a nail is to be fired; and

(2) disabling said nail firing mechanism if said orientation corresponds to said nail firing mechanism not being in line with a location on said work piece where a nail is to be fired.

5 79. The tool of claim 71, wherein said one or more guides includes at least one laser beam.

80. A tool adapted to operate on a work piece, said tool comprising:
means for detecting position data for one or more guides;
10 means for determining an orientation of said tool based at least in part on said position data; and
means for adjusting said tool in response to said orientation determined by said means for determining.

15 81. The tool of claim 80, wherein said tool includes:
a set of one or more indicators; and
means for asserting at least one indicator in said set of one or more indicators in response to said orientation of said tool.

20 82. The tool of claim 80, wherein said means for adjusting includes:
means for adjusting an orientation of said component in response to said orientation determined by said means for determining.

25 83. The tool of claim 80, wherein said means for adjusting includes:
means for adjusting a state of said component in response to said orientation determined by said means for determining.

84. The tool of claim 80, wherein said one or more guides includes at least one laser beam.